

Water Stewardship Policy

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DOCUMENT HISTORY

Document Owner

The Solutions Engineering Director is the owner of this document. The owner shall review this policy annually to confirm that it continues to accurately represent the standards required by Global Switch.

The policy shall be implemented for all new design projects by the Global Switch Delivery team in conjunction with external design consultants. For active facilities the Operations Director will ensure that the principles of minimising water use are considered and applied where practical.

Document History

Issue	Date	Prepared by	Revisions
V1	March 23	BER	First Issue

Review Box

	Signed	Date
Solutions Engineering Director	B. Ryder	13/03/2026



1.0 DOCUMENT PURPOSE

Global Switch is a leading owner, operator and developer of large scale, carrier and cloud-neutral, multi-customer data centre facilities in Europe and Asia-Pacific. Global Switch's core offering is technical space with resilient 24x7x365 power, cooling, connectivity and security for its customers to house their computer servers, network equipment and other IT infrastructure. This document should be considered alongside the Facility Design Policy and the Process for Delivery of Projects and is applicable to all Global Switch locations.

Global Switch recognises the importance of the responsible use of natural resources in the management of data centres; for which water is a key element. Electricity consumption and Power Utilisation Effectiveness (PUE) have long been Key Performance Indicators within the industry and are well understood, however stewardship of water usage is similarly important to ensure that data centre activities and operations are mindful of the impact to environmental and sustainability practices.

The largest water related impact for data centres is in delivering cooling to the building throughout operation and this policy is focussed on that topic. Supply chain water use, for instance during construction and in the manufacture of products and materials is also a consideration and managed through procurement and construction guidelines.

It is acknowledged that there is an intrinsic link between power and water efficiency metrics, with the reduction in use of one resource requiring an increase in the other to maintain the same capacity and performance of central cooling systems. Consequently it is the responsibility of data centre operators to holistically assess the balance between local and regional resource constraints and the impact to wider economies when designing and operating facilities. This document outlines the water related measures and considerations that inform the selection of cooling infrastructure solutions in Global Switch projects globally.

The overriding principle guiding Global Switch designs is:

Where water is used in the operation of data centre cooling systems, it shall be used sparingly

2.0 DATA CENTRE WATER USE

2.1 Purpose & Context

IT equipment in operation generates large quantities of heat which must be efficiently extracted from the vicinity of the IT equipment and dissipated outside the building to maintain operating conditions. In the context of data centres, the density of IT deployed means that facilities may have significant installed capacity of heat rejection systems; typically dissipating heat to atmosphere, but also to alternative heat sinks such as large bodies of water.

In rejecting heat to atmosphere the infrastructure may be air-cooled, relying solely on the convection of ambient air being passed across a heat exchanger, or may utilise water typically in an evaporative system to improve the efficiency of the heat transfer. It should be noted that the water is not 'consumed' in this process but is returned to atmosphere as part of the hydrological cycle. The natural high-efficiency is the reason that the majority of industrial cooling systems rely on an evaporative cooling process; from large thermal-generation power stations to factory premises.

Whilst data centres which use water to assist the performance of cooling systems clearly require large volumes of water there is a misperception within the general public as to the extent compared to other industries such as steel production and agricultural industries. Agriculture in particular uses considerably more water annually than the data center industry, with the ratio in the UK reaching approximately 10:1. Furthermore the volume of water lost through leakages in national distribution networks regularly exceeds the demand of the data centre industry.

2.2 Water Usage Effectiveness (WUE) Targets & Methodology

PUE and WUE calculations are governed by the ISO/IEC standard 30134. WUE is a useful metric in order to quantify a data centre's water use; however, it is much more influenced by differences in climate, cooling technology and other factors than PUE. The EU Data Centre Alliance (EUDCA) have established a methodology for incorporating a number of factors, applied to a common baseline to determine realistic target performance for varying geographies. These include:

1. Climate Factor – Based upon the number of Cooling Degree Days at the site location
2. Water Stress Factor – Global Switch use the Aqueduct Water Risk Atlas as the basis for assessing water stress as this provides more current data, and results in more challenging WUE targets, than the Water Exploitation Index
3. Water Type Factor – Acknowledging the reduced community impact of using non-potable or industrial water sources as opposed to fresh or drinking water

Data for these factors is readily available for European geographies due to the work of the EUDCA, whilst Global Switch have expanded the strategy to set appropriate factors for locations in South East Asia as well. The resultant WUE performance targets across the Global Switch locations are tabulated below. As a signatory of the Climate Neutral Data Centre Pact (CNDP) Global Switch is committed to meeting these targets for all new Data Centre developments.

Traditional evaporative cooling systems typically employ cooling towers and use water continuously throughout the year; however more sophisticated design solutions may benefit from mixed mode operational scenarios to minimise water usage. The topology preferred by Global Switch has the ability to operate in a dry-mode when ambient conditions are suitable, or when the building demand is low. Contrary to PUE this means that water efficiency is not necessarily the highest when IT load is 100% of the system design, and the optimum efficiency may be at part load.

Site	Resultant WUE
Amsterdam	0.4
Frankfurt	0.5
London	1.0
Madrid	0.4
Paris	1.3
Bangkok	0.6
Hong Kong	1.8
Johor	1.8
Singapore	1.8

TABLE 1: GLOBAL SWITCH WUE TARGETS BY LOCATION

All new construction projects will be required to demonstrate by calculation through the design process that these targets are achieved. Existing operational facilities will strive to similarly achieve these figures through operational management and, where appropriate, infrastructure upgrade projects. Global Switch will publish WUE performance annually within the company ESG report.

2.3 Power and Water balance

Where ambient conditions are suitably low in comparison to the operating temperature of cooling water in the data centre, natural heat rejection may be viable resulting in 'free-cooling'. As ambient temperature increases additional cooling is required; either via the evaporation of water or using a 'mechanical' cooling system, with the most common being vapour-compression. A vapour-compression system requires additional energy to compress the refrigerant in the system to a higher pressure and temperature enabling it to reject the heat in the condenser. The additional energy required is usually electrical power. Vapour compression also requires refrigerants which contribute to global warming and are potentially harmful to the environment.

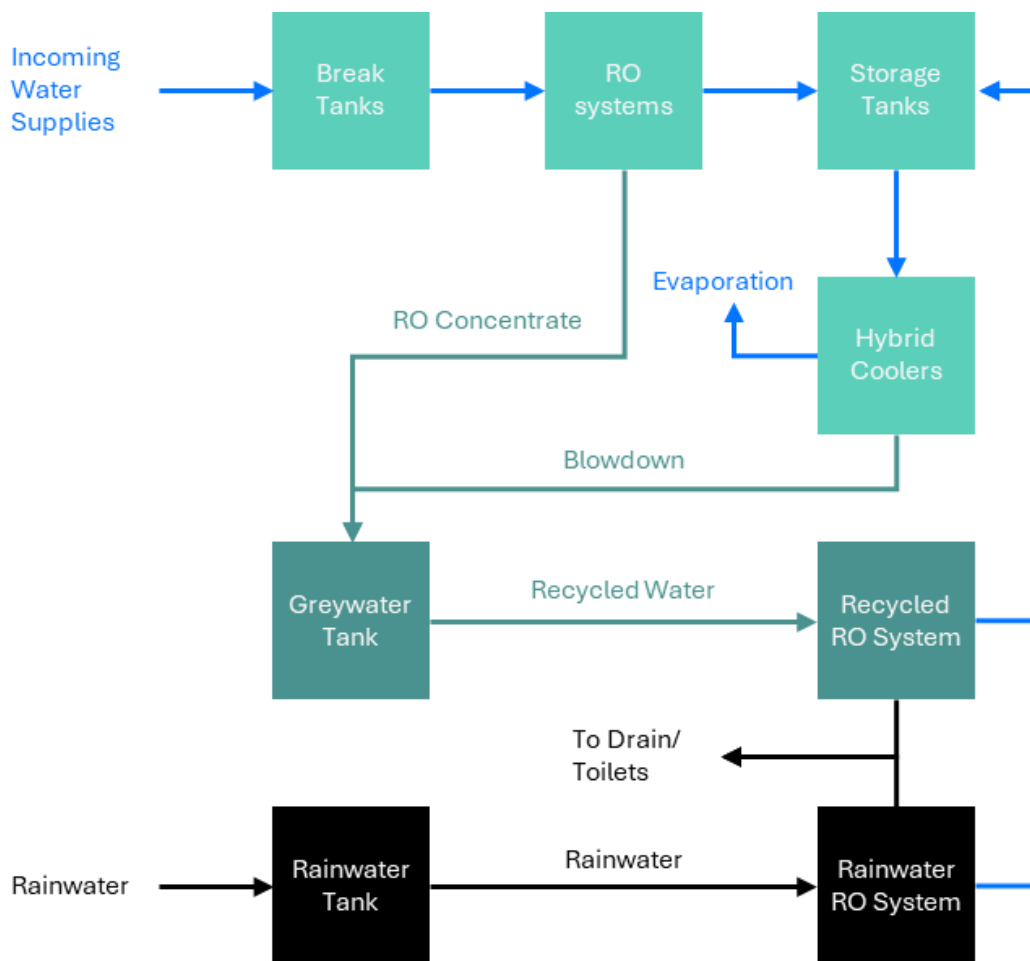
Consequently, there is an inherent balance between electrical and water usage of cooling systems, where an increase in PUE may result in a reduction of WUE and vice versa. Analysis should be undertaken for all installations in order to be able to establish the most effective WUE and PUE operating modes at varying load demand, climate and operating conditions.

Furthermore in many regions the electricity grid is at least partially generated by power stations which themselves use water for cooling. Consequently the increase in electricity demand of a purely air-cooled data centre may use more water when considered holistically. A true comparison is therefore only reliable if WUE and PUE consider resource consumption from source rather than limited to the boundary of the facility. A 2022 ASHRAE study determined that for three different US locations, the overall water consumption was between 20 and 60% lower when water was used for cooling purposes at the data centre rather than at the power station. Where electricity grids have a higher renewable contribution, or where water stress is greater at the data centre location than the power station however this should influence the selection of cooling system.

3.0 WATER STEWARDSHIP IN DESIGN

Global Switch consider the use of water as part of a holistic resource strategy for data centre buildings; however the fundamental driver shall be that where water is used in the operation of cooling systems, it shall be used sparingly. Where water use is included within design non-potable water sources will be utilised where available. In order to achieve this objective there are a number of key principles which Global Switch employ in the design and operation of water-cooled heat rejection systems:

- Availability of alternative, non-potable, water sources shall be investigated for all cooling system demand
- The power-water balance in both peak and annualised ambient conditions shall be assessed
 - Consideration given to the electrical grid energy mix and associated water use of power generation
 - Awareness of increased carbon footprint associated with increased electricity use
- Designs shall minimise the use of water through offering mixed mode operational strategies
 - Including dry and evaporative ‘free cooling’ alongside mechanical systems
 - Include PUE optimised and WUE optimised control strategies to prioritise conservation of electricity or water depending on changing resource constraints
- Water conservation measures shall be evaluated and incorporated where viable including
 - Treatment of water to maximise cycles of concentration in the Process Water network
 - Recycling of discharged water from cooling plant and water treatment processes
 - Rainwater harvesting from building and hard landscapes



- Review WUE improvements as a fundamental part of the design process to ensure water is used sparingly

Thank you

For taking the time to familiarise yourself with this document, if you have any questions please do not hesitate to contact a member of our team, or alternatively, further information can be found on our website:

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